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### **REMARKS**

This response is intended as a full and complete response to the final Office Action mailed September 23, 2005. In the Office Action, the Examiner notes that claims 1-14 are pending and rejected. By this response, Applicants have amended claims 1, 10, and 14. No new matter has been entered.

In view of both the amendments presented above and the following discussion, Applicants submit that none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. §103. Thus, Applicants believe that all of the pending claims are now in allowable form.

It is to be understood that Applicants, by amending the claims, do not acquiesce to the Examiner's characterizations of the art of record or to Applicants' subject matter recited in the pending claims. Further, Applicants are not acquiescing to the Examiner's statements as to the applicability of the art of record to the pending claims by filing the instant responsive amendments.

### **REJECTIONS**

#### **35 U.S.C. §103**

##### **Claims 1, 3-7, 9-11, 13 and 14**

The Examiner has rejected claims 1, 3, 7, 9, 10, 11, 13 and 14 as being obvious and unpatentable under 35 U.S.C. §103(a) over U.S. Patent 6,597,841 to Dingel et al. (hereinafter "Dingel"). Applicants respectfully traverse the rejection.

In general, Dingel teaches an optical device for receiving an optical signal of one or more wavelengths including an n-way optical coupler to split the optical signal by an intensity ratio into n branch signals. In particular, Dingel teaches an arrayed waveguide grating which includes a first optical slab having n input ports, where each branch signal is coupled to a different input port, and an waveguide array structure including a plurality of waveguides having incrementally different path lengths. (Dingel, Abstract).

Dingel, however, fails to teach or suggest Applicants' invention of at least claim 1, as a whole. In particular, Dingel fails to teach or suggest at least the limitation of "wherein the passive portion and the active portion are integrated in accordance with active/passive monolithic integration techniques, wherein the active portion comprises at

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least one active device for modifying at least one of said first polarization component and said second polarization component." Specifically, Applicants' claim 1 positively recites:

1. An integrated polarization splitter having a passive portion and an active portion, comprising:

an arrayed waveguide grating (AWG) in the passive portion, the AWG including:

an input coupler;

an output coupler; and

a plurality of waveguides of unequal length connecting said input and output couplers;

wherein at least two output ports of said AWG are positioned relative to an input port such that a first polarization component and a second polarization component of a single channel input signal arriving at different phase fronts of a free space region at an output side of said AWG are respectively received by separate ones of said output ports such that said first polarization component and said second polarization component are split by said AWG; and

wherein the passive portion and the active portion are integrated in accordance with active/passive monolithic integration techniques, wherein the active portion comprises at least one active device for modifying at least one of said first polarization component and said second polarization component.

[Emphasis added.]

Dingel is completely devoid of any teaching or suggestion of an active portion or integration of an active portion and a passive portion, much less integration of an active portion and a passive portion in accordance with active/passive monolithic integration techniques. In fact, Dingel is completely devoid of any active devices or device integration techniques whatsoever. Rather, Dingel merely teaches a passive, multi-output arrayed waveguide grating device having n-way optical couplers and an arrayed waveguide grating for demultiplexing optical signals. In other words, Dingel merely teaches passive splitting of optical signals into a plurality of associated optical signal components. Nowhere in Dingel is there any teaching or suggestion of any active devices, much less integration of active devices with the multi-output arrayed waveguide grating device. Therefore, the Dingel reference fails to teach or suggest Applicant's invention as a whole.

The test under 35 U.S.C. §103 is not whether an improvement or a use set forth in a patent would have been obvious or non-obvious; rather the test is whether the claimed invention, considered as a whole, would have been obvious. Jones v. Hardy,

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110 USPQ 1021, 1024 (Fed. Cir. 1984) (emphasis added). Moreover, the invention as a whole is not restricted to the specific subject matter claimed, but also embraces its properties and the problem it solves. In re Wright, 6 USPQ 2d 1959, 1961 (Fed. Cir. 1988) (emphasis added). The Dingel reference fails to teach or suggest Applicant's invention as a whole.

Therefore, Applicants submits that independent claim 1 is not obvious and fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder. Furthermore, independent claims 10 and 14 include limitations substantially similar to the limitations of claim 1. Therefore, for at least the same reasons discussed above with respect to independent claim 1, Applicants submits that independent claims 10 and 14 are also not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

As such, Applicants submit that independent claims 1, 10 and 14 are patentable over Dingel under 35 U.S.C. §103(a). Furthermore, claims 3-7, 9, 11, and 13 depend directly or indirectly from independent claims 1 and 10 and include additional limitations therefor. Therefore, for at least the same reasons as discussed above with respect to independent claims 1, 10 and 14, Applicants submits that dependent claims 3-7, 9, 11 and 13 are also not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, Applicants respectfully request that the rejection be withdrawn.

#### Claims 2 and 12

The Examiner has rejected claims 2 and 12 under 35 U.S.C. §103(a) as being obvious and unpatentable over Dingel as applied to claims 1 and 10 above and further in view of U.S. Patent 6,853,769 to McGreer (hereinafter "McGreer"). The Applicants respectfully traverse the rejection.

For at least the reasons discussed above, independent claims 1 and 10 are non-obvious in view of Dingel and are patentable under 35 U.S.C. §103(a). Furthermore, McGreer fails to bridge the substantial gap between Dingel and Applicants' invention. In general, McGreer discloses an arrayed waveguide grating with waveguides of unequal widths. In particular, McGreer discloses that each waveguide of the grating has a

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substantially uniform width, but the width of any single waveguide in the grating is selected based on a predetermined birefringence required for the waveguide.

McGreer, however, is completely devoid of any teaching or suggestion of an active portion or active device. As such, McGreer must be devoid of any teaching or suggestion of the integration of an active portion and a passive portion, much less integration of an active portion and a passive portion in accordance with active/passive monolithic integration techniques. Furthermore, McGreer must also be completely devoid of any teaching or suggestion that an active portion includes at least one active device for actively modifying polarization components produced by the passive portion of the polarization splitter.

Thus, the Dingel and McGreer references, either singly or in combination, fail to teach or suggest Applicants' invention as a whole. Therefore, independent claims 1 and 10 are non-obvious over Dingel in view of McGreer and are patentable under 35 U.S.C. §103. Furthermore, claims 2 and 12 depend directly from independent claims 1 and 10 and recite additional limitations therefor. Thus, for at least the reasons discussed above, claims 2 and 12 also are non-obvious over Dingel in view of McGreer and are patentable under 35 U.S.C. §103. Therefore, Applicants respectfully request that the rejection be withdrawn.

#### Claim 8

The Examiner has rejected claim 8 under 35 U.S.C. §103(a) as being obvious and unpatentable over Dingel as applied to claim 1 above and further in view of U.S. Patent 5,838,870 to Soref. Applicants respectfully traverse the rejection.

For at least the reasons discussed above, independent claim 1 is non-obvious in view of Dingel and is patentable under 35 U.S.C. §103(a). In particular, Dingel fails to teach or suggest at least the limitation of "wherein the passive portion and the active portion are integrated in accordance with active/passive monolithic integration techniques, wherein the active portion comprises at least one active device for modifying at least one of said first polarization component and said second polarization component," as taught in Applicants' invention of at least claim 1. Furthermore, Soref fails to bridge the substantial gap between Dingel and Applicants' invention.

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In general, Soref discloses nanometer-scale silicon-on-insulator (SOI) photonic components. Soref discloses nanometer-scale silicon-on-insulator guided-wave optical components in the near infra-red, including a quantum well portion using intersubband or band-to-band photonic effects. In particular, Soref discloses integration of waveguides and quantum wells. Although Soref teaches the integration of many thousands of such components on a silicon chip, Soref is completely devoid of any teaching or suggestion that the active portion includes at least one active device for actively modifying at least one of a plurality of polarization components produced by the passive portion. Rather, Soref specifically teaches that the waveguides simply guide the received optical signals to the multiple quantum well (MQW) portions which operate as active devices. As such, the active devices of Soref do not modify separate polarization components of an optical signal. Rather, the active devices of Soref modify un-separated optical signals. Thus, Soref fails to teach or suggest Applicants' invention of claim 1, as a whole.

Furthermore, Dingel and Soref cannot even be operably combined. As described herein, Dingel discloses an optical device for demultiplexing optical signals using an AWG. The AWG uses input and output couplers for coupling the waveguide array to input and output fibers respectively. As described herein, Soref teaches active strip-waveguide devices. Soref teaches coupling a light beam from an optical fiber into a strip-waveguide, or coupling a light beam from a strip-waveguide into an optical fiber. Since Dingel teaches a passive arrayed waveguide grating for coupling optical signals and optical fibers and Soref teaches active individual waveguides for coupling optical signals and optical fibers, the means for coupling optical signals into and out of optical fibers is completely different for Dingel and Soref, and since multiple such coupling means may not be employed simultaneously, Dingel and Soref simply cannot be operably combined.

As such, the Dingel and Soref references, either singly or in combination, fail to teach or suggest Applicants' invention as a whole. Therefore, independent claim 1 is non-obvious over Dingel in view of Soref and is patentable under 35 U.S.C. §103. Furthermore, claim 8 depends directly from independent claim 1 and recites additional limitations therefor. Thus, for at least the reasons discussed above, 8 also is non-

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obvious over Dingel in view of Soref and is patentable under 35 U.S.C. §103. Therefore, Applicants respectfully request that the rejection be withdrawn.


### CONCLUSION

Thus, Applicant submits that none of the claims presently in the application are obvious under the of 35 U.S.C. §103. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Michael Bentley at (732) 383-1434 or Eamon J. Wall at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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